

1. (CANCELED)

< 2. (CURRENTLY AMENDED) ~~An actuator as claimed in claim 1 wherein An~~

< electric actuator comprising:

< a bottom-contained casing;

< a motor in the casing;

< a motor shaft, for the motor, extending through an opening of the

< casing;

< a housing fixed to the opening of the casing;

< a worm on a portion of the motor shaft in the housing;

< a worm wheel rotatably mounted to the housing to mesh with the

< worm;

< a first radial bearing which supports the motor shaft between an axial

< end and the worm of the motor shaft;

< a second radial bearing which supports the motor shaft opposite the

< axial end near the worm; and

< a thrust bearing at the bottom of the casing to support the motor

< shaft,

< wherein the first and second bearing are made of metal and

< equidistantly spaced from the worm.

< 3. (CURRENTLY AMENDED) ~~An actuator as claimed in claim 1 wherein An~~

< electric actuator comprising:

< a bottom-contained casing;

< a motor in the casing;

< a motor shaft, for the motor, extending through an opening of the

< casing;

< a housing fixed to the opening of the casing;

< a worm on a portion of the motor shaft in the housing;

< a worm wheel rotatably mounted to the housing to mesh with the

< worm;

< a first radial bearing which supports the motor shaft between an axial

< end and the worm of the motor shaft;

< a second radial bearing which supports the motor shaft opposite the
< axial end near the worm; and
< a thrust bearing at the bottom of the casing to support the motor
< shaft,
< wherein the first bearing is smaller in external diameter than the
second bearing.
< ~~4. (CURRENTLY AMENDED) An actuator as claimed in claim 1 wherein An~~
< electric actuator comprising:
< a bottom-contained casing;
< a motor in the casing;
< a motor shaft, for the motor, extending through an opening of the
< casing;
< a housing fixed to the opening of the casing;
< a worm on a portion of the motor shaft in the housing;
< a worm wheel rotatably mounted to the housing to mesh with the
< worm;
< a first radial bearing which supports the motor shaft between an axial
< end and the worm of the motor shaft;
< a second radial bearing which supports the motor shaft opposite the
< axial end near the worm; and
< a thrust bearing at the bottom of the casing to support the motor
< shaft,
< wherein the thrust bearing comprises a thrust-radial ball bearing to
support the motor shaft rotatably.

5. (ORIGINAL) An actuator as claimed in claim 4 wherein a bore which projects from the bottom of the casing is formed, an inner race of the thrust-radial ball bearing being fixed to an axial end portion of the motor shaft, an outer race being fixed to an inner circumferential wall of the bore.

6. (ORIGINAL) An actuator as claimed in claim 4 wherein an inner race of the thrust-radial ball bearing is engaged on a smaller-diameter portion of the motor shaft, a female thread of a lock nut meshing with a male thread of the smaller-diameter portion of the motor shaft.

7. (CURRENTLY AMENDED) An actuator as claimed in claim 4 wherein an inner race of the thrust-radial ball bearing is engaged on a smaller-diameter portion
< of the motor shaft, the thrust-radial ball bearing being held by one of a welded or a
< padded portion of one of the smaller-diameter portion or the casing.

8. (CURRENTLY AMENDED) An actuator as claimed in claim 7 wherein
< the one of the welded or padded portion is formed by radiating a laser beam.

9. (CANCELED)

< 10. (CURRENTLY AMENDED) An actuator as claimed in claim [[9]]14
< wherein a direction of rotation is detected by the rotation detector in addition to the angle of rotation with both of the angle and direction of the rotation being converted into a digital signal by the encoding means.

< 11. (CURRENTLY AMENDED) An actuator as claimed in claim [[9]]14
wherein the encoding means comprises an electronic circuit on an electronic circuit substrate.

< 12. (CURRENTLY AMENDED) An actuator as claimed in claim [[9]]14
wherein the outer circumferential surface of the rotary disc has magnetic material in
< which a magnetic pole is directed in a rotational direction, and the [[said]] rotation detector being a hall element.

< 13. (CURRENTLY AMENDED) An actuator as claimed in claim [[9]]14
wherein the outer circumferential surface of the rotary disc has a slit through which
< light passes, or a black-and-white pattern which reflects or absorbs light, and the [[said]] rotation detector being a photo coupler.

14. (CURRENTLY AMENDED) An actuator as claimed in claim 9 wherein
< An electric actuator comprising:
< a bottom-contained casing;
< a motor in the casing;
< a motor shaft for the motor which extends through an opening of the
< casing;
< a housing fixed to the opening of the casing;
< a worm on a portion of the motor shaft in the housing;
< a worm wheel rotatably mounted to the housing to mesh with the
< worm;

< a first radial bearing which supports the motor shaft between an axial
< end and the worm of the motor shaft;
< a second radial bearing which supports the motor shaft opposite the
< axial end near the worm;
< a thrust bearing at the bottom of the casing to support the motor
< shaft;
< a rotary disc which is fixed to the motor shaft to rotate together with
< the motor shaft;
< a rotation detector for electrically detecting an angle of rotation; and
< encoding means for converting the angle of rotation into a digital
< signal;
< wherein [[the]]an electronic circuit has a non-volatile memory to
measure the angle of rotation as absolute value.

15. (CURRENTLY AMENDED) ~~An actuator as claimed in claim 9 wherein~~

< An electric actuator comprising:
< a bottom-contained casing;
< a motor in the casing;
< a motor shaft for the motor which extends through an opening of the
< casing;
< a housing fixed to the opening of the casing;
< a worm on a portion of the motor shaft in the housing;
< a worm wheel rotatably mounted to the housing to mesh with the
< worm;
< a first radial bearing which supports the motor shaft between an axial
< end and the worm of the motor shaft;
< a second radial bearing which supports the motor shaft opposite the
< axial end near the worm;
< a thrust bearing at the bottom of the casing to support the motor
< shaft;
< a rotary disc which is fixed to the motor shaft to rotate together with
< the motor shaft;
< a rotation detector for electrically detecting an angle of rotation; and

< encoding means for converting the angle of rotation into a digital
< signal;
< wherein [[the]]an electronic circuit has a memory in which stored
data is kept by battery to measure the angle of rotation as absolute value.

16. (NEW) An actuator as claimed in claim 15 wherein a direction of rotation is detected by the rotation detector in addition to the angle of rotation with both of the angle and the direction of the rotation being converted into a digital signal by the encoding means.

17. (NEW) An actuator as claimed in claim 15 wherein the encoding means comprises an electronic circuit on an electronic circuit substrate.

18. (NEW) An actuator as claimed in claim 15 wherein an outer circumferential surface of the rotary disc has magnetic material in which a magnetic pole is directed in a rotational direction, and the rotation detector being a hall element.

19. (NEW) An actuator as claimed in claim 15 wherein an outer circumferential surface of the rotary disc has one of a slit through which light passes and a black-and-white pattern which one of reflects and absorbs light, and the rotation detector being a photo coupler.